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Northern – Southern Hemisphere comparison of aeolian dust records over the last 800 ka

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Insoluble dust in East Antarctic ice cores derives from aeolian deflation of the Southern Hemisphere continents and atmospheric transport. Mineral particles from EPICA Dome C and Vostok ice cores mainly originated from southern South America during glacial times. The large increase of dust concentration in cold glacial periods is probably the consequence of the great extension of the ice caps and periglacial areas, bigger continental aridity, and change in the atmospheric circulation.

In the frame of the European Project for Ice Coring in Antarctica (EPICA) the concentration of insoluble microparticles in the deep ice core from Dome Concordia (Dome C, 75˚06'S; 123˚21'E) Antarctica, has been measured using two different methods. Discrete samples were analysed over the whole length of the core with the Coulter counter method at intervalls between 0.55 m and 6 m. Additionally, a laser microparticle detector was coupled to a Continuous Flow Analysis system for continuous measurement from 770 m to 3190 m depth at 1 cm resolution. Both records are essentially identical when compared at the same resolution.

The Dome C dust record covers the last 800'000 years, back to the marine isotope stage 19, and reveals eight glacial-interglacial cycles. The good agreement of our record with ice volume records shows that dust concentration can be linked at first order to the global ice volume. Furthermore our record suggests an overall trend towards more extreme conditions in more recent times for both glacial and interglacial periods with progressively higher dust inputs during glacial periods and a lesser in-

put during the following interglacial periods. Thus the Dome C dust record shows a similar pattern as records of Asian loess magnetic susceptibility and ^{4}He from equatorial West Pacific marine sediments, both indicating a progressive increase for the aeolian activity during glacial periods and for soil pedogenesis during interglacials. For South East Asia this could be a consequence of intensification of the glacial winter monsoon and the interglacial summer monsoon respectively, possibly associated to the slow uplift of the Tibetan Plateau. While the Dome C dust record reflects the South America (Patagonia) continental source, the similar pattern points to a kind of long term north-south teleconnection between the two regions.